

IN THE SPECIFICATION:

Please replace paragraph [0036] with the following replacement paragraph:

As shown in FIG. 3, the printer 100 may include a communication interface 305 that allows the printer 100 to be communicatively coupled to at least one other electronic device. Depending on the desired input, the interface 305 may allow the ~~computer~~ printer 100 to communicate with a wide variety of different electronic devices that can provide the printer 100 with time-based media to print. Without intending to limit the types of devices, the interface 305 may allow the printer 100 to receive media data from external sources such as computer systems, computer networks, digital cameras, cellular telephones, PDA devices, video cameras, media renderers (such as DVD and CD players), media receivers (such as televisions, satellite receivers, set-top boxes, radios, and the like), digital video recorders (such as a TiVO), a portable meeting recorder, external storage devices, video game systems, or any combination thereof. The connection type for the interface 305 can take a variety of forms based on the type of device that is intended to be connected to the printer 100 and the available standard connections for that type of device. For example, the interface 305 may comprise a network interface, for example an interface supporting a broadband network connection, for sending and receiving time-based data in multiple media forms to or from an external service or device. For example, the interface 305 may comprise a port for connecting the device using a connection type such as USB, serial, FireWire, SCSI, IDE, RJ11, parallel port (e.g., bi-directional, Enhanced Parallel Port (EPP), Extended Capability Port (ECP),

IEEE 1284 Standard parallel port), optical, composite video, component video, or S-video, or any other suitable connection type.

Please replace paragraph [0039] with the following replacement paragraph:

In another embodiment, the printer 100 includes a docking station 370 that is built into the printer 100. In another example, the docking station is a component attachable to the printer's housing 102 which provides access to a communication interface (e.g. 305) of the printer 100. The docking station 370 may be configured to accommodate any type of external devices, such as cell phones, digital audio recorders, video camcorders, portable meeting recorders, fixed position meeting recorders, head-mounted video cameras, office-based PC experience capture systems, or any other suitable type of multimedia external devices. Moreover, the printer 100 may have a plurality of docking stations 370 to accommodate multiple types of external devices. Furthermore, it will be understood that an external device [[150]] may also be communicatively coupled to the communication interface 305 via an external docking station.

Please replace paragraph [0045] with the following replacement paragraph:

In another embodiment, the video capture hardware 355 is coupled to a converter module 360, such as VGA-to-NTSC conversion hardware. Such an embodiment could be used in conjunction with a projector to capture presentations made with the projector. Audio capture could also be employed to record a speaker's oral presentation. To use the

video capture hardware 355 in this way, a user could connect a laptop or other computing system and the projector to the printer 100. The printer 100 then captures video frames as fast as it compares them to the most recently captured frame and retains those frames that are different. A parallel audio track may also be saved. This capability could also be used in a desktop printer to record a presentation made on a computing system connected to the printer. The printer can then ~~serve~~ save the audio itself or it can be written to a digital medium, such as an SD disk that can be played from a cell phone or a PDA. The audio could also be written to a bar code on a printed representation.

Please replace paragraph [0046] with the following replacement paragraph:

In another embodiment, the printer 100 comprises an ultrasonic pen capture device [[365]]. In this embodiment, the printer 100 includes [[a]] an ultrasonic pen capture device hardware module 365 that serves as a low-cost sensor that can be coupled to a paper document. With such a device, a user can write on a paper document, and the results are saved on the printer 100. In one form, the captured results include the user's writing in combination with time data that indicates when the writing occurred. This time-based media data can then be printed or sent (e.g., by electronic mail) to someone else, for example showing a user's notes as well as time stamps that indicate when the notes were taken. It is noted that there are several other methods for capturing pen strokes and time data, using pens that scan patterns printed on paper, or using special writing surfaces such as electromagnetic tablets.

Please replace paragraph [0067] with the following replacement paragraph:

FIG. 12 illustrates a user interface display for selecting a video multimedia processing function in accordance with an embodiment of the present invention. Available functions preferably include event detection, color histogram analysis, face detection, face recognition, optical character recognition (OCR), motion analysis, distance estimation, foreground/background segmentation, scene segmentation, automobile recognition, license plate recognition, and industrial inspection. As can be seen in FIG. 12, user interface 110 provides a user with the ability to select from among these options. In FIG. 12, display 302 of UI 110 includes a user instruction 502, instructing the user to select the desired multimedia processing function. Display 302 also includes the available options, which in the illustrated case are selectable via buttons for Print Segment 503, Event Detection 524, Color Histogram Analysis 526, Face Detection 504, Face Recognition 522, Optical Character Recognition (OCR) 512, Motion Analysis 506, Distance Estimation 511, Foreground/Background Segmentation 514, Scene Segmentation 518, Automobile Recognition ~~516~~ 516, License Plate Recognition 521 and industrial inspection 528. A button 418 is also provided in one embodiment to allow the current input to be changed, as described above with respect to FIG. 9. Finally, a cancel button 312 is available that returns the user to a previous screen, and a continue button 314 is available to be selected when the user has specified all of the desired processing functions.

Please replace paragraph [0069] with the following replacement paragraph:

In one embodiment, the system includes a printer embedded user interface 110 and/or a user interface (e.g.) 180 at a coupled external device (e.g. networked external device 170 or a docked cell phone or personal digital assistant) to allow a user to preview the generated outputs. If [[215]] the user desires to refine 215 the processing, the user can enter commands, which the printer 100 receives 220 by way of the user interface (e.g. 110 or 180). Based on the user's commands, the printer 100 then repeats the processing 210 of the media data to generate new output. This refinement process can be iterated until the user is satisfied with the printed 175 or electronic output 190. When this occurs, the user will indicate that the printing should commence, for example, by invoking a print command with the user interface (e.g. 110 or 180) (See, for example, Figure 10 discussed above.) The media processing system 125 then sends the generated output to the corresponding output system (e.g. printed output 175 to the printed output system 115 or the electronic output 190 to the electronic output system 120). The corresponding output system 115, 120 then creates 225 an output.

Please replace paragraph [0073] with the following replacement paragraph:

The resource allocation module 680 comprises a communication interface module 684 which includes an external system detection module 688 and one or more specific communication protocol modules 686, a resource table manager 682, and a task policy manager 690. The external system detection module 688 detects the presence of an

external system. For example, the module 688 is notified that an external device has connected to a port or is notified via a registration message of the availability of an external service. The external system detection module 688 can utilize such protocols as Plug and Play (PnP) or Universal Plug and Play (UPnP) to automatically detect and communicate with devices that have PnP capabilities. Similarly, the communication interface module 684 can use a UPnP protocol to communicate directly with a device, identify its capabilities, and learn about the presence and capabilities of other devices attached to it. UPnP is an example of a specific protocol that may be used by a UPnP specific protocol module 686 for communication with a device. Examples of other protocols include device specific protocols, proprietary protocols, standards based protocols, http and other World Wide Web based protocols. Different embodiments can comprise one or a combination of specific protocol modules. From the communication interface 684, the resource table manager 682 retrieves the capabilities of the external device or service and stores a profile 117 of those capabilities so that they are associated with the respective device, for example, by an external system identifier (ESID) in the resource table 118. The resource table manager 682 notifies the task policy manager 690 with the ESID that an external system profile 117 has been updated. Examples of capabilities are processor characteristics[,]; processing level or percentage of a service, for example a busy message, or average time for task completion[,]; a current processor usage percentage[,]; software applications, for example voice recognition software[,]; hardware functionality, for example transcoding hardware[,]; or memory availability. Based on the capabilities of the printer 100 and the external

system 750 and criteria such as computing power, availability, functionality or user input, the task policy manager 690 defines or updates existing policies for tasks. A policy directs which resources will be used for tasks, and in what role, master or slave, the different resources operate. In one embodiment, a master resource controls the processing for a task. For example, a master controls the order in which a request will be processed. For example, a multimedia server 610 acting as an http server in a client / server relationship determines the order in which client requests for video files are processed. In another example, a master task interface 616 controls the operation of an external device or sends commands to control certain functionalities of the external device. For example, the task policy control module 618 enforces a task of communicating with a docked cell phone as requiring a software driver (e.g., a master task interface 616) of the multimedia server 610 that acts in a master role. The driver [[616]] communicates with a docked cell phone to download pictures from the cell phone or to issue commands to the cell phone to take a picture with the cell phone's digital camera or take a video with the cell phone's video camera. The picture can show who is standing at the printer 100, and that data could be transmitted to some other destination by the cell phone when it calls out under the direction of the printer. The called number could be stored in a profile stored on the cell phone, or it could be stored on the printer for use in generating a video paper document 175 or an electronic output 190. In one embodiment, a slave responds to the master's instructions and waits for further instructions from the master until released from the master due to timeout or task completion or other criteria. For example, the multimedia server 610 can comprise a

slave software interface that stores MPEG2 data in the multimedia database 116 when received from a master transcoding hardware module of an external video recorder connected through a port or network connection to the printer 100. In one embodiment, a task policy is embodied in an Extensible Markup Language (XML) document. The task policy manager 690 notifies the multimedia server 610 that a policy has been updated or created and provides the ESID.

Please replace paragraph [0075] with the following replacement paragraph:

Figure 8 is a flow diagram of a method for allocating resources for a media processing task. For illustrative purposes, this method is discussed in the context of the resource allocation module 680 of Figure 6. The resource allocation module 680 receives 802 a request for a media processing task. Such a request can be generated by user input or from an external device or external service. The module 680 determines 804 a resource or resources for performing the task based on criteria. An example of a resource is an embedded media processing module or a combination of such modules. Another example of a resource is media content processing software available at an external service, or multimedia format transformation hardware and / or software on an external device. Criteria can be based on user input. For example, user interface 110 displays on a display (e.g. web display 545) a list of external services and/or external devices accessible by the printer 100 as well as printer resources that can perform a media processing task, for example, segmenting a video into clips. A mouse click or

touchscreen can be used to indicate selection of a resource or data entry (e.g. typed keyboard entry or a selected directory path from a directory listing of an external device); to ~~[[can]]~~ indicate an external system identifier (ESID), for example, a Uniform Resource Indicator (URI) or Uniform Resource Locator (URL); or to indicate ~~[[or]]~~ software and /or hardware and / or firmware on an external device by an identifier such as a directory location. ~~Figure 12 illustrates a user interface display for enabling a user to allocate processing resources from among or between printer resources and external system resources in accordance with an embodiment of the present invention~~ A resource allocation example arises in the context of ~~an example involving~~ a printer with hardware and/or software interfaces for a portable meeting recorder. A portable meeting recorder, composed of a video camera with a 360-degree lens and a microphone, is docked to the printer 100. The multimedia data files are downloaded to the printer. The content-based processing module 660 dewarps the video and extracts key frames from the multimedia data files. Those key frames are chosen to show at least one image of every meeting attendee. Face detection and tracking can be used to find the largest and most well-composed image of each participant. In this example, a task policy 119 associated with the portable meeting recorder device ~~[[160]]~~ may allocate the sub-task of face recognition to an external application on an external computer system 170 on an internal network 155 of a business because the computer system has a very fast processor and access to a database of face recognition files identifying people associated with the business such as employees, contractors, customers or visitors. Or the task policy 119 can reflect user

input indicating whether the face recognition is performed by the A/V content recognition module 670 or the external application.

Please delete paragraph [0076].

Please replace paragraph [0077] with the following replacement paragraph:

A media processing resource performs a function related to a media processing task, for example format conversion or segmentation of an audio or video selection into clips. A media processing resource can be implemented in hardware, software, firmware or a combination of these. Hardware can include both electronic and optical hardware. FIG. 13 illustrates an example of a user interface display for enabling a user to allocate media processing resources from among or between printer resources and external system resources in accordance with an embodiment of the present invention. The user interface display includes an identifier 1318 of the content selection being processed, in this example, an MPEG-2 file entitled “Strategy Meeting 3/01/04” [[1318]] and a sub-title 1302 indicating the task or sub-task with which the resources are allocated, in the example, “Face Recognition Resources.” The display also includes several selection indicators. [[a]] A selection indicator 1304 for representing represents an identifier of a printer resource, in this example, an identifier of a face recognition application within the A/V Content Recognition Module 670[[, an]]. An indicator 1305 [[of]] represents the monetary cost of running the face recognition application within the A/V Content

Recognition Module 670 (e.g., it might be licensed to charge the user per invocation)[[,]]. ~~and also includes a~~ A selection indicator 1306 [[of]] represents an identifier of an external resource, in this example, an identifier of an external face recognition application on an external device or service, ~~and an~~ An indicator 1307 represents [[of]] the monetary cost [[1307]] of running the face recognition application on the external device or service. More selection indicators for additional resources can be displayed based on their availability in the system. A default selection indicator 1308 when selected provides user input indicating to the resource allocation module 680 to use a default allocation of resources for this task. Once the face recognition is complete, in one example, a specialized face tracking application 690 or in another example, the content-based processing module 660, performs the tracking of the identified face in the video's content. In this example, a user can decide to allocate the printer's face recognition application to a subset of video segments and allocate the external application to process another subset of video segments from the video. The user display 302 includes a segment selection indicator 1310 allowing a user to select all, the current segment, or a subset. This allows the user to indicate parallel processing for the face recognition task by allocating different resources to different segments of the video. A video paper document (printed output 175) is created from the multimedia recording that includes bar codes that refer to the multimedia data stored on the portable meeting recorder, or an associated PDA. The multimedia is played by swiping the bar codes with a tethered bar code reader or by imaging the bar codes with a video camera interfaced to the portable meeting recorder.

Please replace paragraph [0078] with the following replacement paragraph:

FIG. 14 illustrates an example of a user interface display for displaying the status of processing a task in accordance with an embodiment of the present invention. The user interface display 302 includes an identifier 1418 of the content selection being processed, ~~[[agin]]~~ again in this example, the MPEG-2 file entitled “Strategy Meeting 3/01/04~~[[’]]~~,” and a sub-title 1402 indicating the task or sub-task with which the displayed processing status of resources is applicable, in the example, “Face Recognition Processing Status.” The display also includes one or more resource identifiers 1404, 1406. In this example, ~~1404 represents an identifier~~ 1404 represents ~~[[of]]~~ a face recognition application within the A/V Content Recognition Module 670, and ~~1406 represents an identifier~~ 1406 represents ~~[[of]]~~ an external face recognition application on an external system. For the printer resource, slider 1408 indicates that 40% of the face recognition task it is processing is complete, and for the external system resource, slider 1410 indicates that 60% of the face recognition task it is processing is complete. Responsive to user input indicating selection of an associated cancel button 1412, 1414, the task processing on the associated resource is stopped. Responsive to user input indicating selection of an associated “OK” button 1416, 1418, the user interface 110 exits the processing status display 302. The user interface displays can also be displayed on a user interface (e.g. 180) of an external system (e.g. 170, 160).

Please replace paragraph [0082] with the following replacement paragraph:

In order to allow this interaction, without modifying printer driver architecture of the underlying operating system, an extra mechanism, such as the one shown in FIG. 15, is constructed. A “UI Listener[[,]]” program 1554 listens to a network socket, accepts requests for information 1508, interacts with a user to obtain such data, and then sends the data back to the requester.

Please replace paragraph [0083] with the following replacement paragraph:

Once a print request 1502 is sent by user 1550 and notification is requested 1504 from the UI listener [[1504]] 1554, the print job is sent 1506 by application 1552. Here, the print job contains embedded information including the network address of the UI listener 1554, authentication information, and the latest time that the client will be listening for requests.

Please replace paragraph [0084] with the following replacement paragraph:

If the printer 1556 requires additional information [[of]] or confirmation, it sends a request 1508, which is detected by the UI listener 1554, which displays a dialog box 1510 to obtain input from the user [[1510]] 1550. An example of such a request might be a request for a password or user confirmation code that the user must enter to access a ~~database~~ an application server 1558. The user’s input is included in a reply 1512 sent to the printer. If the reply does not satisfy the printer it may ask for additional information

(not shown). If the reply does satisfy the printer, it takes a next step. This step might be to perform an external action such as sending an email (not shown). The next step might also be sending a request for information 1514 to an application server (such as a database) 1558. In this example, application server 1558 also sends a request for information [[816]] 1516, which is detected by the UI listener 1554. The user 1550 is prompted 1518 and his response forwarded 1520 to the application server [[1520]] 1558. In this example, a reply 1522 is then sent from the application server 1558 to the printer 1556. It will be understood that a particular embodiment may include either or none [[or]] of requests 1508 and 1516 without departing from the spirit of the present invention.

Please replace paragraph [0085] with the following replacement paragraph:

A UI ~~listener program~~ listener program such as that shown in FIG. 15 as UI Listener 1554 may have a fixed set of possible interactions, or may accept a flexible command syntax that allows the requester to display many different requests. An example of such a command syntax would be the standard web browser's ability to display HTML forms. These forms are generated by a remote server, and displayed by the browser, which then returns results to the server. In this embodiment, however, the UI listener is different from a browser in that a user does not generate the initial request to see a form. Instead, the remote machine generates this request. In the described embodiment, the UI listener is a server, not a client.

Please replace paragraph [0088] with the following replacement paragraph:

Consider an example in which the multimedia database 116 includes a music catalog, or a video database, or a movie database or a digital photo catalog, or a combination of one or more of these media types. The user interface 110 displays a print dialog box on the display (e.g. display 545) which presents the user with a list of the songs, a list of video recordings, a list of movies or a list of photos, resident in the printer 100 or accessible to it via an external service 160 or external device 170. The user can ~~ehese~~ choose to “print” any of those songs, videos, movies or photos. Responsive to input indicating a content selection, if previewing is a feature of the printer, and user input indicates 215 previewing is requested, the content selection is provided 225 in the sensual form appropriate to its type. For example, if a song is selected and previewing is requested, a digital version of the song is retrieved from the database 116, converted from ~~analog to digital~~ digital to analog form ([[e.g]] e.g., A/D 335) and played through a speaker system 330 for the user. In a similar fashion, the media processing system 125 can cause a video to be displayed, or a preview version of it to be displayed, on an embedded or attached video display 535. Similarly, a selected photo forwarded from a web server of an external service 160 can be previewed and displayed on the web page display 545. In another example, the database is communicatively coupled to an internal database (e.g. of company recorded meetings). Additionally, in the example of an embedded digital photo catalog, a user can select pictures for printing or generate an index document of photos without having to turn on a separate computer networked to

the printer. For example, if every time a user prints a jpeg image, the printer automatically or under control of the print dialog box, saves a copy of the jpeg on the printer, she can build a personal photo archive and peruse the archive without turning on her desktop computer.

Please replace paragraph [0090] with the following replacement paragraph:

Responsive to user input indicating a preferred print medium, the multimedia server 610 transfers the content selection in a format suitable for that print medium to the suitable printed output system 115 or the electronic output system 120. In the case of the song catalog, examples of the print medium that can be used are a CD or cassette. In the case of a video or a movie, examples of the print medium that can be used are a DVD or videocassette. In the case of the photos, examples of the print medium that can be used are paper or a memory stick. In one example, the database of content selections can be updated through a network interface 150 by downloading from a web site via the web server [[110]] for instance. Various embodiments of a multifunction printer having multimedia functionality are possible applications for a printer in accordance with embodiments of this invention. A number of specific embodiments for such a printer are described in a co-pending U.S. patent application entitled, "Printer with Multimedia Server," filed March 30, 2004, Attorney Docket No. 20412-08351, which application is incorporated by reference in its entirety.

Please replace paragraph [0100] with the following replacement paragraph:

As explained, the printer 100 may include an embedded content-based processing module 660, which enables the printer 100 to receive and process real-time broadcasts of media data responsive to the content of the media. In one embodiment, the printer 100 includes an embedded receiver, such as a television, satellite, or cable, radio, or other type of media receiver. The printer 100 may further include processing logic that can monitor a live media feed, ~~recording~~ record media, generate a printed representation of the media, and play the audio or video on the printer's console. The printer 100 thus enables the live monitoring of the content of radio or television broadcasts and the generation of paper and storage of multimedia in response to events detected in those streams.

Please replace paragraph [0105] with the following replacement paragraph:

A cell phone is docked directly with the printer 100, thereby eliminating the need to attach the cell phone to a PC. The multimedia processor 125 of the printer 100 automatically downloads still frame images, audio and video clips that are resident on the cell phone to the printer 100. The content-based processing module 660 represents the data as a video paper document, and prints that document. The multimedia data output can also be sent to an electronic output system 120 where the data can be written on an external storage site, or a removable media card. The media card can be played on the cell phone using the cell phone digital camera as a bar code reader. Or if the media were uploaded to a web site via network connection 150 that provides a streaming media

service, the user could call that site and play the media on the cell phone after entering the necessary access codes. Keying digits on the keypad of the cellular phone provides random access to points in the recording indicated by bar codes and other human-readable text. That text can also include phone numbers called while the corresponding multimedia data were recorded. If those phone numbers correspond to address book data on the cellular phone, it can also be included in the ~~print-out 160~~ printed output 175.

Please replace paragraph [0106] with the following replacement paragraph:

A video camcorder is docked directly with the printer 100, thereby eliminating the need to attach the camcorder to a PC, and the still frame images, audio and video clips that are resident on the camcorder are downloaded to the printer 100 via multimedia server 610 and which are formatted by the content-based processing module 660 as a video paper document which the printed output system 115 prints. The multimedia data can also be written on an external storage site, or a removable media card. The media card can be played on the camcorder, using its camera as a bar code reader. Or if the media can be uploaded to a web site that provides a streaming media service via network interface 150 that couples the printer to a web server on the network 155[[]], the user can login to that site later and play the media in a web browser after entering the necessary access codes. Other human-readable text could be printed near the bar codes that indicate the [[data]] date and time when the recording was made as well as the location of the person, if available from something like a GPS receiver.